REPLACED BY ART 34

Claims

1. A particulate, modified chromium oxide catalyst for the polymerisation of ethylene or ethylene with α-olefins, **characterised** by comprising:

a) a chromium-oxide catalyst comprising a chromium oxide combined with an inorganic support,

b) a transition metal compound comprising at least one cyclopentadienylic ring bonded to said transition metal, which cyclopentadienylic ring may contain hetero atoms, be unsubstituted or substituted, bonded to the transition metal through a bridge, optionally annealed to other substituted or unsubstituted ring structures, and if two cyclopentadienyl rings are present they may be bonded to each other through a bridge, and

c) a catalyst activator.

2. A catalyst according to claim 1, **characterised** in that said inorganic support contains above 85% by weight of silica.

3. A catalyst according to claim 1 or 2, **characterised** in that the chromium is mainly in a bivalent oxidation state.

4. A catalyst according to claim 1, 2 or 3, **characterised** in that the transition metal is titanium, zirconium or hafnium.

5. A catalyst according to any of claims 1 to 4, **characterised** in that the catalyst activator is an aluminoxane.

6. A catalyst according to claim 5, **characterised** in that the aluminoxane is methylaluminoxane.

7. A catalyst according to any of claims 1 to 6, **characterised** in that the catalyst contains 0.4 to 10 % by weight of Cr; 0.1 % to 0.6 % by weight of Zr or Hf; and 5 % to 20 % by weight of Al; calculated as metals based on the total weight of the catalyst.

8. A catalyst according to claim 7, **characterised** in that the catalyst contains 0.4 to 1 % by weight of Cr, about 0.2 % by weight of Zr, and about 5 % by weight of Al.

9. A catalyst of any of the preceding claims, **characterised** in that said catalyst has the shape of spherical or spheroidal particles.

10. A method for the preparation of a catalyst for the polymerisation of ethylene, or ethylene with α-olefins, **characterised** by comprising the steps of:

a) subjecting a chromium oxide catalyst precursor, which comprises a chromium oxide compound combined with an inorganic support, to a temperature in the range of from 400 to 950 °C under oxidising conditions, and

b) impregnating the obtained chromium catalyst with a catalyst activator and with a transition metal compound which comprises at least one cyclopentadienylic ring bonded to said transition metal and at least one ligand selected from the group comprising alkoxy, amido and hydrocarbyl radicals, halogen and hydride bonded to said transition metal, which cyclopentadienylic ring may contain hetero atoms, be unsubstituted or substituted, be bonded to said transition metal through a bridge, and optionally annealed to other substituted or unsubstituted ring structures, and if two cyclopentadienyl rings are present they may be bonded to each other through a bridge, and

c) subjecting the thus obtained particulate catalyst to drying conditions.

11. The method of claim 10, characterised in that said oxidised catalyst precursor obtained in step a) further is subjected to reducing conditions to obtain a major part of the chromium in a divalent oxidation state before being subjected to step b).

12. A polyethylene produced by the homopolymerisation of ethylene or copolymerisation of ethylene with α-olefins in the presence of a catalyst according to any of the preceding claims under conditions of continuous feeding of reactants and removal of polymerisate.

09/601652

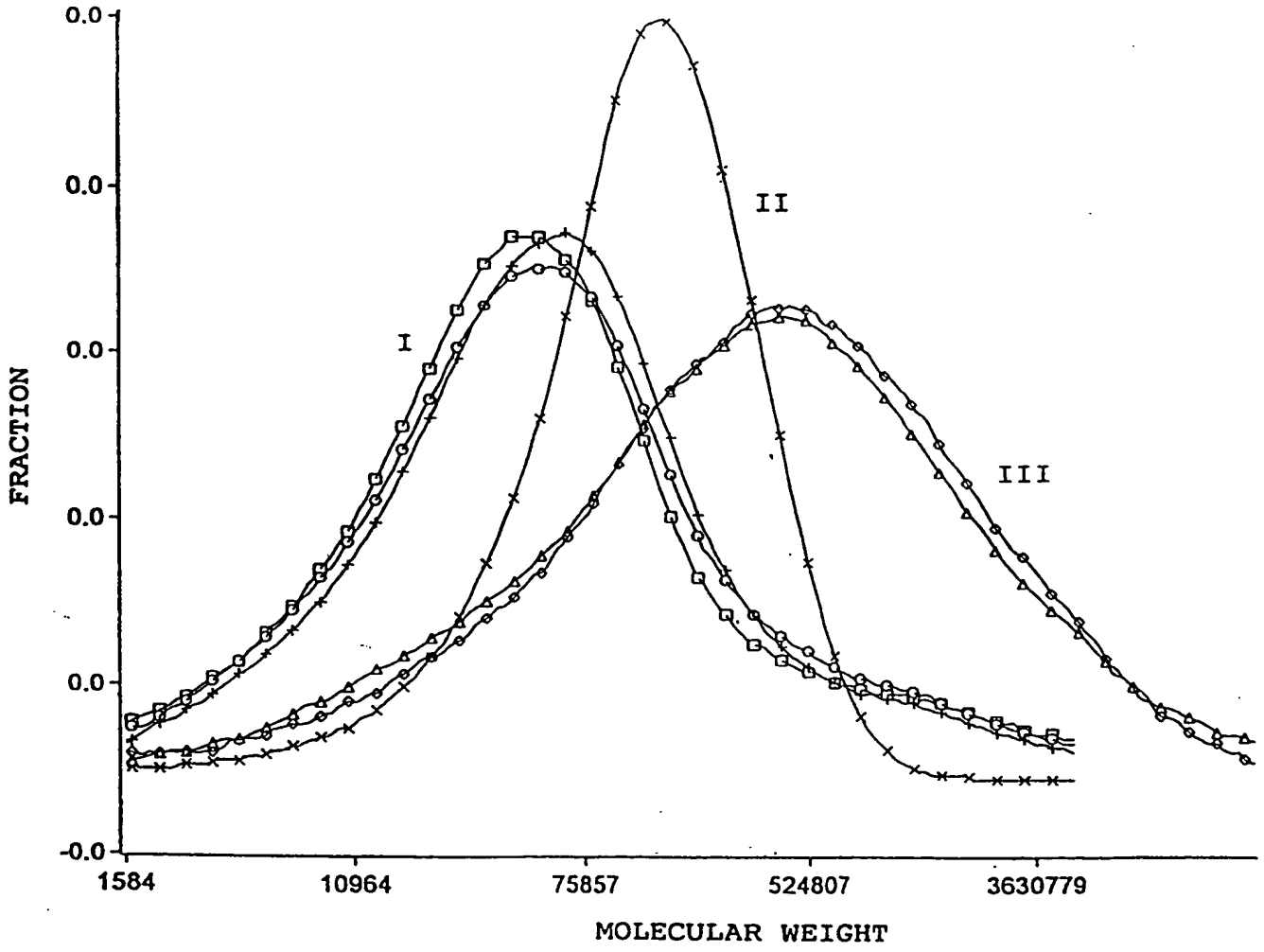

FIG. 1